

# ACHIEVING BEST VALUE THROUGH A WHOLE OF NETWORK APPROACH TO ROAD PLANNING AND ASSET MANAGEMENT

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## ABSTRACT

Over the last two years the Queensland Department of Transport and Main Roads (QTMR) has adopted a whole of network, state-wide approach to managing its state-controlled roads. The purpose of this approach is to improve the level of service provided to road users by focusing on getting best value from the funding available. The state-wide approach achieves four objectives by:

- identifying strategic road network needs arising from economic and population growth
- addressing priorities on a state-wide basis using clearly identified project selection criteria
- adopting infrastructure and non infrastructure solutions
- meeting government objectives for the road network.

Key elements of this approach include a revision of key strategy documents to clearly set out network objectives, developing road route strategies and road link plans to identify network deficiencies and possible solutions and costs and developing and publishing a five year funding program.

The benefits of this approach include:

- an increased focus on longer term planning to meet clearly identified network objectives
- program development must occur in line with available funding
- increased state-wide consistency in the level of service provided to road users
- adoption of a fit for purpose approach to engineering solution selection
- acceptance of a staged approach to network improvement.

## 1. INTRODUCTION

Road agencies across Asia and Australasia face a similar challenge - planning and providing for a future road system that meets increasing community expectations with a decreasing resource base. In other words, how to do more with less. QTMR certainly sees planning as a high priority to address this challenge.

To meet this challenge QTMR has changed the way it manages the road network. It has moved from a regionally based investment and planning model to adopt a state-wide approach with a focus on achieving best value from the resources available, enabling it to better meet government outcomes. To do this QTMR has had to change long term practices and approaches to road planning and investment management. This paper sets out the challenges facing QTMR and how the department responds to them.

## 2. THE MANAGEMENT TASK

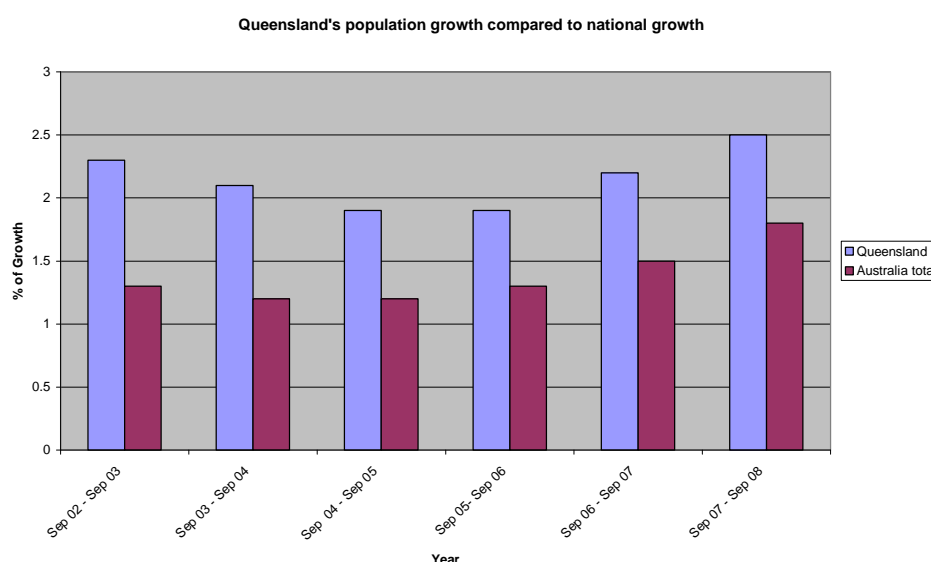
QTMR owns, plans, constructs, operates and maintains 33,550 km of state road network. This represents 25% of the total state-controlled network across Australia and is slightly less than 20% (18.6%) of the total road network in Queensland. The network connects major intra and interstate centres and carries 80% of the state's traffic. The estimated value of the road network is approximately \$72 billion, making it the state government's largest publicly owned physical infrastructure asset. These roads are used for a wide range of purposes, including freight, tourist trips, daily commutes, travel to access services and recreation. A map of the state-controlled road network is at Attachment 1.

The network is struggling to accommodate large increases in transport demand driven by population and economic growth and associated increases in freight and commuter traffic. This has resulted in unsustainable growth in congestion on parts of the network and increasing difficulty in maintaining levels of service on a system wide basis.

## 2.1 Population

The annual growth rate of Queensland's population has been above that of the rest of Australia since 1971. Queensland's share of the national population has steadily increased as well. Queensland accounted for 20.1% of the national population in the September quarter 2008, compared with 16.6% in the September quarter 1988.<sup>1</sup> Figure 1 shows a population growth comparison between Queensland and the national average. Queensland has experienced a high and sustained level of population growth over the past ten years of 2.3% per annum<sup>2</sup>. This makes it the largest growing state in Australia, after Western Australian. This rate is well above the rate of increase in OECD predominantly urban regions of 0.8% increase per annum over the past ten years.<sup>3</sup> Also, in the year to the September quarter 2008 Queensland, and Western Australia, recorded the State's highest levels of net overseas migration in the 27 year history of the current population series. This was driven by the resources boom and associated infrastructure investment, as well as very low unemployment.<sup>4</sup>

Figure 1



Source: Australian Bureau of Statistics, Population Series

## 2.2 Economic Growth

<sup>1</sup> Office of Economic & Statistical Research, Queensland Economic Review, Queensland Government, April 2009

<sup>2</sup> Office of Economic & Statistical Research Australian Demographic Statistics, Queensland Government, September 2008

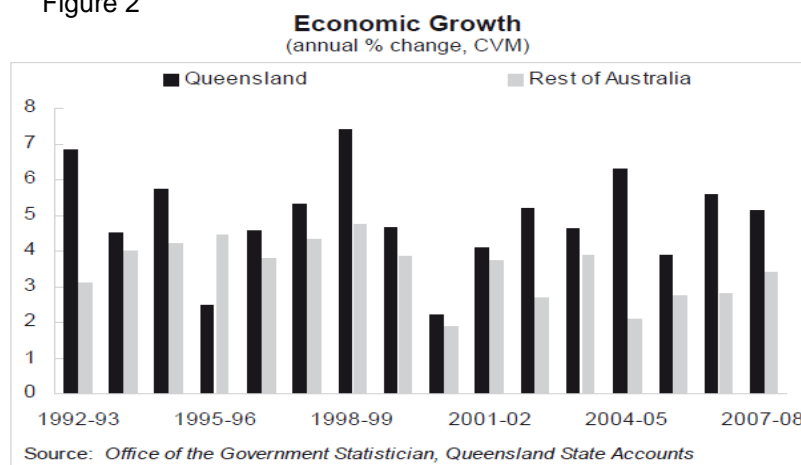
<sup>3</sup> OECD Report: Regions at a Glance 2009

<sup>4</sup> Ibid

For the 12th consecutive year, in 2007-08, the Queensland's economy expanded well above the 3.4%<sup>5</sup> growth in the rest of Australia. See Figure 2 below. In 2007-08 the Queensland economy expanded by 5.1%<sup>6</sup> supported by:

- the volume of business investment rose 12.1%<sup>7</sup>, the fourth consecutive year of double-digit growth
- public investment, particularly in water, energy and transport infrastructure, increased by 7.4%<sup>8</sup> to support strong population growth and global demand for the state's resources
- employment in Queensland increased 2.8%<sup>9</sup> in 2007-08, representing the second highest jobs growth of any state (following Western Australia at 3.6%), and a growth rate stronger than the national average of 2.7%<sup>10</sup> for the seventh consecutive year
- the volume of exports rose 1.8%<sup>11</sup> in 2007-08, despite a range of adverse influences throughout the year
- Queensland's recorded jobs growth of 2.8% in 2007-08, and the unemployment rate fell to a 34-year low of 3.7%<sup>12</sup>, well below the rest of Australia for the fourth consecutive year.

Figure 2



Source: BTRE Report 112: *Freight Measurement and Modelling*, 2006

## 2.3 Freight

Queensland's freight task is becoming more complex and growing faster than the state's population growth. Road freight accounts for over 37% of Queensland's domestic freight task, while export of goods and services comprises about one quarter of Queensland's Gross State Product. Non-service exports, mainly from mining, agriculture and manufacturing, currently contribute 80% of that amount, creating a significant long-haul freight task. The Bureau of Infrastructure, Transport and Regional Economics (BITRE) predicts the road freight task in Queensland will more than double by the year 2020. While the

<sup>5</sup> Queensland Government 2007-08 Annual Economic Report

<sup>6</sup> Ibid

<sup>7</sup> Ibid

<sup>8</sup> Ibid

<sup>9</sup> Ibid

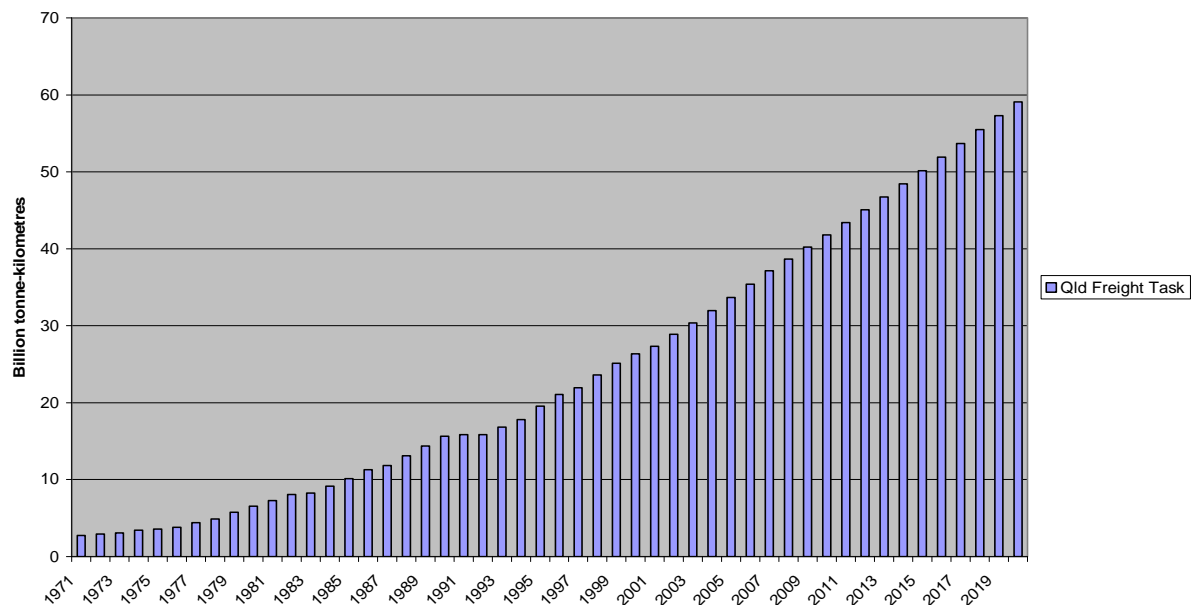
<sup>10</sup> Ibid

<sup>11</sup> Ibid

<sup>12</sup> Ibid

“non-bulk” part of the task will have the greatest increase, the “bulk” part of the task will also increase dramatically. Figure 3 illustrates the likely Queensland increase.

Figure 3 Queensland Road Freight Task Estimates & Projections (BTRE 2006)



Source: BTRE Report 112: *Freight Measurement and Modelling*, 6

The recent Infrastructure Partnership Australia report, *Meeting the 2050 Freight Challenge*<sup>13</sup>, estimates the country's freight task will triple by 2050 to 1540 billion tonne-kilometres, driven mainly by an increase in the population to 37.8 million, and demographic changes. This is equivalent to Australia needing to build capacity equivalent to the country's entire existing network twice over. A tripling of the freight task may require a massive increase in annual spending on transport.<sup>14</sup>

The challenge of a growing freight task is even greater in urban areas where the increasing demand for road space for freight vehicles is compounded by the increasing number of passenger vehicles and light commercial vehicles. More of the urban freight task will be carried by light commercial vehicles, growing from 72% to a forecast 83% of the total urban task by 2020<sup>15</sup>. This reflects the just-in-time delivery and increase in shelf products that our urban society demands. Vehicle kilometres travelled by articulated trucks in urban areas is forecast to treble, from 0.69 billion vehicle kilometres in 1990 to 2.29 billion vehicle kilometres<sup>16</sup>. The massive increase in the number of vehicles in urban areas will impose costs not only on commuters but also increasingly on the transportation of freight in intra-urban trips.

<sup>13</sup> Report by Infrastructure Partnerships Australia, *Meeting the 2050 Freight Challenge* (release date not yet available)

<sup>14</sup> Red tape snarls road and rail freight planning, *The Australian* May 9, 2009

<sup>15</sup> National Transport Commission "Twice the Task" A Review of Australia's Freight Task, 2006

<sup>16</sup> Ibid

## 2.4 Significant urbanisation/ congestion

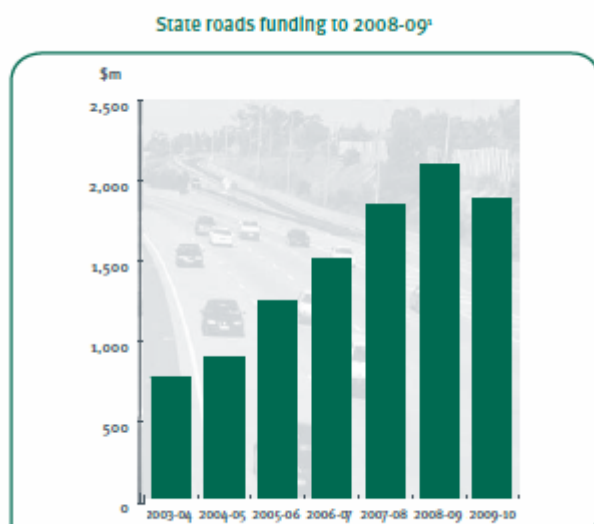
The growth in the freight task and population in Queensland is increasing pressure on the road system, and the resulting congestion is expected to become substantially heavier along Brisbane's eastern corridor. This corridor gives direct access to the Australia Trade Coast port and airport precinct. The greatest pressure from growing urbanisation is concentrated in the south east corner of the state, but major coastal and regional centres are also experiencing congestion issues. The cost of road congestion for Brisbane, estimated by BITRE is currently about \$1.2 billion per annum<sup>17</sup>, which contributes 13.3% to the national total congestion cost of \$9 billion per annum<sup>18</sup> in lost productivity. By 2020, the aggregate cost projections are forecast to double to approximately \$3 billion for Brisbane, which is 15% of a national total of \$20 billion. Rapid population growth and the increasing freight task are major contributing factors to increases in travel time in Queensland. BITRE estimates the projected traffic increase in Brisbane for the period 1990-2020 to be 43%, which is greater than any other Australian city.

## 3. FUNDING

To respond to these challenges the Queensland Government has recognised the need for an efficient road network and significantly increased funding to roads over the last six years. The bulk of the QTMR's base funding allocation is sourced from motor vehicle registration fees, funds road network improvements including capital projects, asset maintenance, preservation and operating costs.

Base funding allocations to QTMR through the state government budget process have been in line with growth in motor vehicle registration revenue (approximately 7-9% per annum). For the five years 2008-09 to 2012-13 a total of \$16.5bn is allocated to roads. This an increase of \$2.9bn, or 22%, over the previous five year program.<sup>19</sup> See Figure 4.

Figure 4



Source: Main Roads Implementation Plan 2008-09 to 20112-13

Despite the funding increases, real project costs over the same period have been well above this increase and above Cost Price Index (CPI). On most road capital projects this rate has been approximately 15-20% each year. Table 1 below sets out these increases.

<sup>17</sup> BTRE Working Paper 71: Estimating urban traffic and congestion cost trends for Australian cities, 2007

<sup>18</sup> Ibid

<sup>19</sup> Queensland Government Roads Implementation Program 2008-09 to 2012-13.

**Table 1 Cost Price Indices**

	Increase Dec. 03 to Dec. 04	Increase Dec. 04 to Dec. 05	Increase Dec. 05 to Dec. 06	Increase Dec. 06 to Dec. 07	Increase Dec. 07 to Dec. 08
CPI – Australia	2.6%	2.8%	3.3%	3.0%	3.7%
CPI – Brisbane	2.6%	2.8%	3.4%	3.9%	4.3%
Freight – Australia	4.6%	3.4%	2.7%	1.4%	9.8%
Wage Price – Queensland	3.9%	4.2%	4.4%	4.3%	4.2%
General construction industry – Australia	8.3%	5.0%	4.1%	5.2%	5.1%
General construction industry – Queensland	9.5%	8.6%	5.6%	6.5%	6.2%
Road and Bridge Construction – Australia	4.1%	5.5%	5.4%	4.8%	8.2%
Road and Bridge Construction – Queensland	5.9%	7.1%	7.1%	6.3%	12.9%

Source: ABS Catalogues 6401.0, 6345.0 and 6427.0. Wages figure for 07/08 is Sept. 07 to Sept. 08

There is an ongoing challenge for QTMR - to balance new infrastructure provision to satisfy the demands of our customers, delivering improvements to meet future transport demands while also maintaining the existing asset at an acceptable level within budget constraints. The increased funding allocation to roads in recent years enabling the state to meet some of these challenges is still not adequate to meet the multiple impacts of:

- externally driven cost increases, in excess of CPI (see table above)
- road-based passenger travel growing faster than population
- road-based freight tonnages growing faster than Gross Domestic Product – estimated in 2005, to double over the next 20 years
- network deterioration due to ageing pavements
- additional projects needed to support wider government priorities for example health, water supply and education.

To maximise the benefits of all funding received to address these challenges, QTMR has developed a process to gain best value from available funding.

#### **4. TRADITIONAL APPROACH TO NETWORK PLANNING AND INVESTMENT MANAGEMENT ARRANGEMENTS**

Queensland road management practices have generally reflected the needs of the time. They have gradually become more sophisticated as road system management issues grew and became more complex. When the department was established in the 1920s it was focused on building development roads that connected towns and agricultural produce to railways. During this period the department was highly centralised and road planning and investment decisions were made at the corporate level.<sup>20</sup>

In the 1960s in response to the needs of a decentralised and growing economy and population the department began to regionalise operations. To coordinate these operations the department produced its first comprehensive *Road Plan for Queensland*. The then Main Roads Commissioner stated the plan would enable the department to address “the need to study not only the science of road design and

<sup>20</sup> Queensland Department of Main Roads: From Bulldust to Beef Roads and Beyond, Main Roads - the first 50 years, p10

construction but also the factors which should be weighed in deciding where roads should be built and to what standards”.<sup>21</sup>.

Until 2006, the department had four geographically based regions across the state that covered fourteen districts. The move to a regional focus in the 1960s resulted in funding allocation and road network planning being done on the following regional geographic basis.

- Network investment and planning decisions were made at regional level to achieve targets set out in state investment strategies.
- Funding allocations were made to regions. The regions determined allocations at the district level. Generally, regions received an allocation that was made up of last year's allocation plus a percentage increase to cover increases in costs. However, there were occasional significant fluctuations in allocation to meet identified specific objectives, such as building a new road or construction of a large structure.
- Districts were responsible for delivering the agreed program of works.

The emphasis was on the decentralised nature of the economic zones, population and climatic conditions that required more localised decision-making. While this approach had many benefits, it also could result in inconsistent planning, identification of deficiencies, prioritisation and funding allocation across the state road network. Key issues were:

- priorities not identified on a whole of road system basis
- highest risks across the road system not being identified and treated
- inappropriate allocation of funding across the network
- highest priority road system planning not undertaken.

Increasingly, the department began to undertake more detailed analysis of system requirements to establish system performance targets. In the early 1990s the department produced state-wide investment strategies. These strategies covered the national highways, state strategic and state regional roads providing a coordinated, comprehensive guide for regional staff that clearly set out road system performance targets and road vision standards. At this time the department began to broaden its perspective from being a constructor of roads to being a manager of the road system. The department's change “to undertake a total road system focus, adopt a stewardship role of the state's roads, efficiently deliver road projects and manage road operations” was outlined in 2002 in *Roads Connecting Queenslanders*. This move entailed a clearer focus on operating an integrated transport network and making road system planning and investment decisions.

## **5. STATE-WIDE NETWORK PLANNING**

In 2002 Main Roads introduced the Road System Manager Framework (RSMF), see Table 2 below. This framework was modified from the Austroads Asset Management Framework<sup>22</sup>, to enable the department to manage increasingly complex road system requirements. The RSMF provides a model for an end-to-end process from setting the long term direction, through state-wide planning and program development, to project delivery and review. This ensures the planning choices the department makes deliver government outcomes.

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<sup>21</sup> Ibid p136

<sup>22</sup> Austroads, Integrated Asset Management Guidelines for Road Networks, 2002

Effective state-wide road system planning ensures the long term development of Queensland's road network as part of an integrated transport system. The objectives of state-wide road system planning are to gain best value from the road system by:

- identifying clear and consistent road system performance targets and vision standards
- identifying and prioritising needs for the long term preservation and efficient use of existing infrastructure
- identifying data collection and analysis requirements
- after proper consideration of all treatment solutions, identifying new road infrastructure to support efficient travel, existing, new and emerging industries, and the community.

**Table 2 The Road System Manager Framework**

Phase 1 Outcomes	Phase 2 Road System	Phase 3 Road Corridor	Phase 4 Program Development	Phase 5 Program Delivery	Phase 6 Program Finalisation	Phase 7 Reviews
This phase senses and interprets the external environment to provide tangible direction for Main Roads outcomes and high level outputs.	This phase translates the broad strategic choices and priorities identified under phase 1 into plans of action for improving the state-wide road network. It involves the setting of visionary targets, funding and implementation strategies for a 20 year period.	This phase concentrates on forward plans and road investment strategies at the corridor level which are consistent with the state-wide approach defined under Phase 2.	The aim of this phase is to produce a prioritised list of investment candidates and 5 year program funding (the RIP) across the regions and within the work element categories that make up maintenance, operations and enhancement of the network.	The aim of this phase is to deliver the RIP so that the infrastructure is in operational use and meets the needs identified in earlier phases. It includes the preliminary and detailed design, construction and maintenance of the infrastructure and management of operations within road corridors.	This phase evaluates the project and program performance against targets set in the RIP Business Rules and other departmental policies and directions.	This phase measures actual outcomes against the desired outcomes identified in Phases 1 and 2. The purpose of the phase is to produce performance results and analysis that will inform decision-making back at Phase 1 and 2.
KEY PHASE OUTPUTS						
Roads Connecting Queenslanders	State-wide Plan	Queensland Road System Performance Plan Road Route Strategies Road Link Plans Statement of Intent	Roads Implementation Program	Projects Delivery Progress Reports	Project Finalisation Reports Delivery Performance Report	Asset Performance Report Corridor Performance Report Element Performance Reports

The department's road system planning process involves a number of interlinked strategic planning documents and strategies which provide a systemic approach to translating government outcomes into a road system investment program. These include the:

- Transport Coordination Plan
- Roads Connecting Queenslanders
- State-wide Plan
- Corridor Strategies
- Link Development Plans
- Queensland Road System Performance Plan (QRSPP).

In addition to the state's documents, the department is consistent with the *National Guidelines for Transport System Management in Australia*<sup>23</sup> that provides a consistent framework and processes, methods and tools to assist and guide transport planning and decision-making across Australia.

<sup>23</sup> National Guidelines for Transport System Management in Australia (2<sup>nd</sup> edition) endorsed by the Australian Transport Council, 2006.



A number of other integrated regional and local planning documents also influence, guide and inform the department's planning process, by taking into account unique local needs and demand; documents such as statutory plans (eg regional plans), state planning policies and integrated regional transport plans.

Key principles of the state-wide approach are:

- *whole of network approach*: deficiencies, both capacity and preservation, are identified on a consistent state-wide basis enabling the department to develop the road network to clearly defined standards across the network
- *needs based prioritisation*: identified deficiencies are prioritised on the basis of clear criteria for each road element and prioritised for funding on the basis of risk across the network
- *non infrastructure first* (best transport solution approach): in treating deficiencies the department looks at all possible transport system solutions, ensuring that non infrastructure solutions are assessed prior to deciding on an infrastructure solution
- *affordability*: the network performance targets and vision standards are developed according to what a reasonable road agency would accept. Interim standards are developed to accommodate what can be achieved within available funding. Regions are required to construct to interim standards
- *incremental development*: different priority sections of the road system developed to meet performance targets at variable rates of achievement
- *equity*: QTMR works to ensure the road system is developed to an appropriate standard across the state.

In order to meet the requirements of a state-wide analysis process QTMR has divided the road system into elements. An element is an activity or work item related to the road system that requires resources and/or funding to ensure an appropriate level of service. They constitute the components of work QTMR carries out as an asset manager to maintain, enhance and operate the road system. There are currently 33 maintenance, preservation and operations (MPO) elements that ensure the stewardship of the existing network and three enhancement elements that improve the extent, capacity or functionality of the road system.

Each element warrants a state-wide approach to manage its impact on future road system performance and network operation outcomes. Elements are divided into two categories: MPO and capital enhancement (enhancement). A list of the elements sorted into asset categories is in Attachment 2.

The objectives of element management are to ensure:

- network investment requirements are identified against agreed performance targets and fit for purpose technical standards
- investments are planned consistently across the state-wide road network hierarchy, in accordance with prioritised needs
- adequate data collection and analysis
- QTMR achieves best technical and delivery practice for each element through research, benchmarking and innovation.

Each element has an element manager responsible for developing a two-part element management plan. Part 1 of the plan documents the processes necessary to fulfil the element management task, including:

- performance and prioritisation parameters required for development of Part 2 Plan Outputs
- data and decision support systems

- element deficiency analysis and prioritisation process
- state-wide budget analysis
- work packaging and programming
- project development, delivery and finalisation
- project/program performance review.

Part 2 of the plan details the outputs of the state-wide element management process for the planning period, including:

- a 20 year vision and five year milestone for both unconstrained and constrained funding
- business rules and/or a list of identified and prioritised candidate investment opportunities to correct element deficiencies
- moderated element funding allocation for the element in five-year increments by region and roadset
- the predicted performance outcome for allocated funding
- element management resource requirements
- element performance reporting.

These plans rely on and reflect a close working relationship between the relevant stakeholder groups within the organisation. The element managers work with State-wide Planning Group and regional staff to agree performance targets and milestones, data requirements, performance measures and funding allocations. The element leader is the technical expert, but it is necessary to have all planning and delivery areas of the department involved to ensure successful implementation. Most element management plans require analysis of local needs starting from the state-wide analysis needs list for the element. This analysis results in a list of locally prioritised and costed needs with identified value for money treatments and expected performance. The needs lists are used:

- to provide feedback to the element leader
- during consultation on element funding allocations
- as an input into regional and state-wide program development.

Once approved for funding, regional staff package the needs lists across elements into programs and projects to achieve maximum efficiency in delivery.

QTMR achieves effective performance from each element through good governance. The governance arrangements include an element customer responsible for establishing the performance requirements and monitoring their achievement. The element leaders are responsible for providing authoritative technical leadership, advice, support and governance to state-wide groups and the regions in relation to their assigned elements. General Managers of state-wide planning, programming, delivery and operational groups have a responsibility to ensure that technical governance is applied in the elements for which they are the customer.

Benefits of this approach include:

- *a clear focus on achieving government outcomes across the network*: all work is directed to achieving network performance targets in a coordinated and consistent manner
- *high priority sites treated on a whole of road system basis*: the highest priorities across the road system are treated on the basis of risk regardless of geographical location or traditional funding

allocations. An example of this is the reduction in the number of high risk structures on the road system<sup>24</sup>

- *maximising economic return to the state*: there is an increased use of BCR analysis in prioritising deficiencies for maintenance and preservation as well as capital. In order to achieve best BCR results regional staff are looking to implement low cost high benefit treatments consistent with a fit for purpose approach
- *having the necessary data to make decisions*: the department is investing heavily to complete its data set (approximately \$75 million over the next five years) and complete data analysis systems
- *better able to forecast funding/performance scenarios*: completing the data set and the analytical systems enables the department to develop superior forecasting and predictive models
- *build more convincing funding cases*: the department has been able to use the increased volume of better quality information to build convincing funding cases to the state and Australian governments and Infrastructure Australia. For example, the department has recently received slightly more than \$5 billion of the \$22 billion National Building Program for investment on the state road over the period 2009-10 to 2013-14
- *increased prominence of whole of life asset management requirements*: the implementation of this approach has increased the knowledge within the department and the broader government sector of the importance of whole of life asset management. By implementing this system the department has a more accurate picture of the costs of the works necessary to adequately maintain the road system.

## 6. CONCLUSION

The move to adopt a state-wide planning system is the latest stage in the evolution of QTMR. It represents an entrenchment of the move to a road system manager rather than a constructor of roads. It places the department in a position to be able to respond to the issues presented by a twenty first century transport task. The new approach enables the department to adopt a more comprehensive asset management approach to managing the road system.

Because of the long lead times necessary to measure changes to road system condition, as yet, it is difficult to assess the results, in quantitative terms, of the move to a state-wide planning approach. Also, there are many other factors that can impact on condition, principally the amount of funding available. Nonetheless, the changes set out in this paper have had a profound impact in terms of changing attitudes towards asset management of the road system and in changing the way the department identifies and funds road system asset management. Adopting a state-wide approach has required minor adjustments during its implementation but the idea remains intact. There is general acceptance of the need to set performance targets and have adequate data and analysis to understand deficiencies on the road system. There is acceptance of the need to prioritise treatment of deficiencies to ensure the highest risk deficiencies are treated first, adopting low cost, high benefit treatments. The department has increased funding to maintain and preserve the road system and has been successful in attracting significant amounts of additional funding through federal programs. The state-wide approach to road system planning and investment has been a success in its initial phase and QTMR will continue to monitor the success of the system in meeting the needs of an increasingly large and complex transport task.

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<sup>24</sup> Main Roads Quarterly Report: State of the Bridge Network by Regions

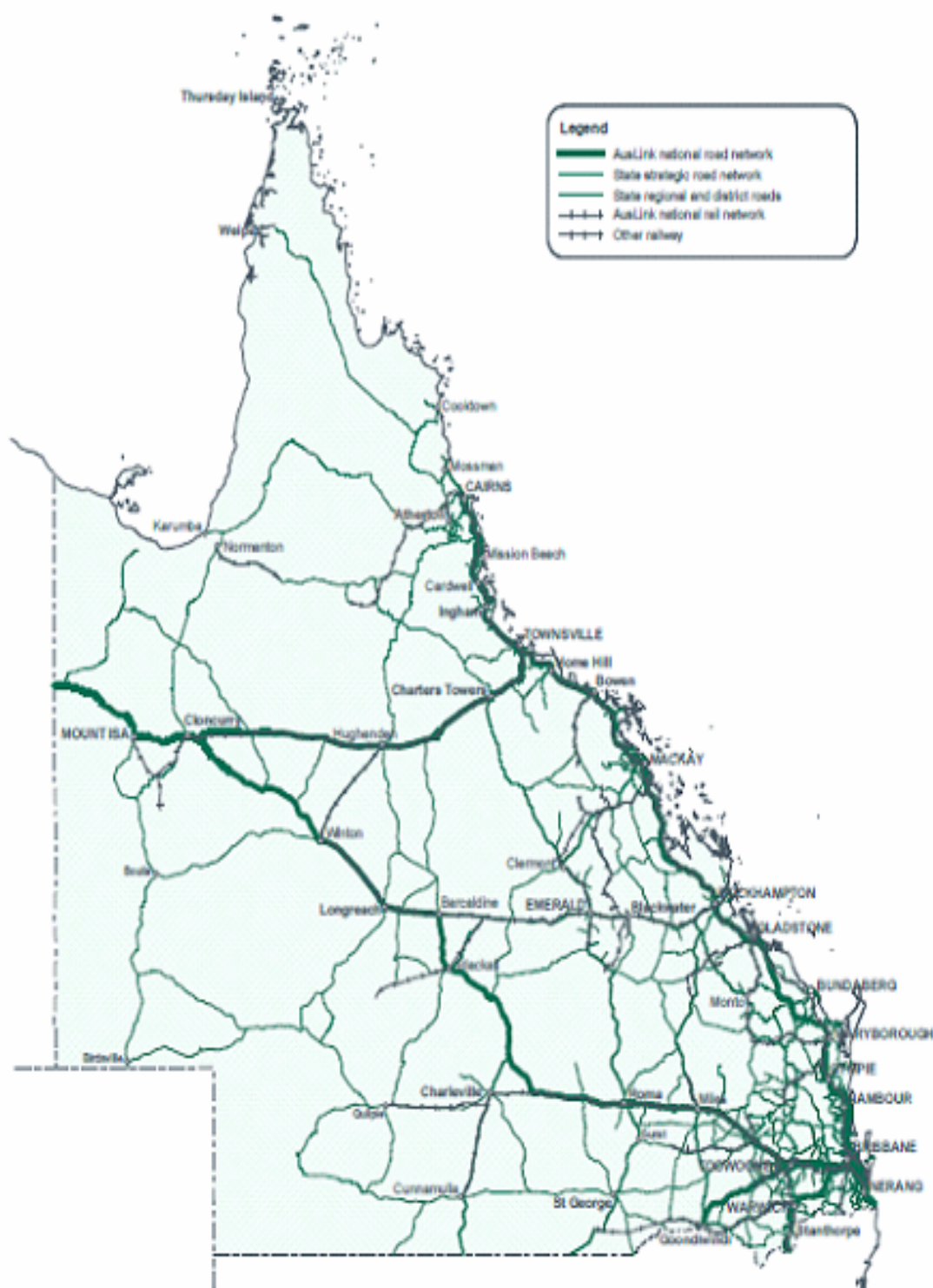
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- 2007-08 Annual Economic Report, Queensland Government

## List of Attachments

- |              |   |
|--------------|---|
| Attachment 1 | Map of Queensland State Controlled Road Network |
| Attachment 2 | Main Roads – List of Road System Elements       |

### Queensland's state-controlled road network



Source: Roads Implementation Program 2008-09 to 2012-13

Maintenance, Preservation & Operations Element mapping in the categories in RIP		
RIP category (RIP Programs)	Element No	Element title (RIP Sub-Programs)
<i>Program maintenance</i>	17	Surfacing treatments sealed
<i>Rehabilitation</i>	18	Pavement rehabilitation
	19	Bridge and culvert rehabilitation
<i>Routine Maintenance</i>	15	Routine maintenance (sealed and unsealed)
	16	Unsealed road re-sheeting
<i>Traffic operations</i>	11	Overload management
	13	Other transport infrastructure maintenance
	33	Incident management
	34	Traffic management
	35	Traveller Information
<i>Corridor management (environment)</i>	1	Contaminated areas
	2	Nature conservation
	3	Degraded areas
	4	Heritage preservation
	5	Declared pest species
	6	Fire risk management
	8	Road landscape
	9	Road traffic noise management
<i>Corridor management (road safety)</i>	7	Management of grids
	10	Performance of rail crossings
	12	Bicycle facilities
	14	Pedestrian facilities
	20	Intersections with high crash frequencies
	21	Hazards close to roads
	22	Hazardous grades
	25	Driver fatigue management
	26	Roadside barrier management
	27	Batter slope management
	28	Caging of overpasses
	29	Skid resistance management
<i>Corridor management (Guidance and illumination)</i>	23	Roadside signing
	24	Roadside and surface delineation
	30	Route lighting
<i>National Disaster Relief &amp; Recovery Arrangements</i>	60	NDRRA